Are spacers made from sealed cold-drink bottles as effective as conventional spacers?

Zar HJ, Brown G, Donson H, et al. Home-made spacers made from sealed-cold drink bottles were as effective as conventional spacers in children with acute asthma. *Lancet* 1999;354:979-982.

QUESTION

In children with acute asthma, are homemade spacers as effective as conventional ones for improving response to a β_2 agonist given by metered-dose inhaler?

DESIGN

Randomized (allocation concealed), blinded, controlled trial with 15- to 30-minute follow-up.

SETTING

A children's hospital in South Africa.

PATIENTS

Eighty-eight children, 5 to 13 years of age (mean age 10 years), 53 (60%) of whom were boys and 44 (50%) of whom had moderate to severe airway obstruction (peak expiratory flow rate 20%-59% of predicted normal value), with a history of asthma, who presented with acute asthma. Exclusion criteria were the inability to use a metered-dose inhaler and spacer or to have pulmonary function tests, having a peak expiratory flow rate of less than 20% of the predicted normal value, an arterial oxygen saturation of less than 92% (as measured in room air), or cardiac or other chronic pulmonary disease; the recent use of oral corticosteroids; or the use of β_2 agonists within 4 hours of presentation. Follow-up was 100%.

INTERVENTION

Children were allocated to 1 of 4 types of spacers: a conventional spacer (Aerochamber; Trudell Medical, Canada) (n = 22); a 500-mL plastic cold-drink bottle with glue to seal the joint between the metered-dose inhaler and bottle (n = 22); an unsealed, 500-mL plastic cold-drink bottle (n = 22); and a 200-mL polystyrene cup (n = 22). Children received fenoterol hydrobromide, 100 µg per puff, in a metered-dose inhaler and spacer, 1 puff every 10 seconds. Children who weighed 25 kg or less (≤55 lb) received 400 µg; those who weighed more than 25 kg received 600 µg.

MAIN OUTCOME MEASURES

Changes in clinical score and pulmonary function and need for nebulization.

MAIN RESULTS

Analysis was by intention to treat. An improvement in lung function was seen in all groups. Results for the sealed bottle group were similar to those for the conventional spacer group; a cup was least effective ($P = 0.02$). Among children with mild airway obstruction, clinical scores, pulmonary function, and need for nebulization did not differ among study groups.

Among children with moderate to severe airway obstruction, clinical scores did not differ among study groups, and a cup was least effective for improving pulmonary function ($P < 0.05$). In children with moderate to severe obstruction, nebulization was needed by 10 of 11 children who used a cup, 9 of 11 who used an unsealed bottle, 8 of 11 children who used a sealed bottle, and 4 of 11 who used a conventional spacer.

CONCLUSION

In children with acute asthma, spacers made from sealed cold-drink bottles were as effective as conventional spacers.

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Funding: Medical Research Council of South Africa

Competing interests: None declared

This article was originally published in *Evidence-Based Medicine* 2000;5:79